Sharing Scarce Resources

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2019

document version
Publisher's PDF, also known as Version of record

Summary

Permit trading schemes—such as emissions trading schemes, fisheries individual transferable quota (ITQ) schemes, and water quality trading (WQT) schemes—are used to regulate the use of scarce resources. While research has shown that well-designed permit trading schemes can help successfully address the environmental problems that led to their development, they are nonetheless far from uncontested. The complexity of factors and preferences that are involved in the choice and design of permit trading schemes have provoked extensive debates. Against this background, this thesis explores the processes by which permit trading schemes are designed.

What, then, are permit trading schemes? Several defining features can be identified: firstly, to establish a permit trading scheme, *a limit must be defined* for the use of a resource or pollutant. Secondly, this limit must be divided into discrete entities, which are *allocated* to participating actors. i.e., members to the scheme. Finally, scheme members can then *trade* their allocations amongst each other, depending on whether it exceeds their actual demand or whether they need additional permits.

This thesis focuses specifically on explaining the choices regarding who gets access to tradable permits (membership), and how much they receive initially (allocation). Deciding on such membership and allocation principles for a permit trading scheme is far from straightforward. In theory, there is a very large potential number of allocation and membership principles to choose from. Moreover, a wide range of actors—such as policymakers, different sectors of the industry, and NGOs—may have different preferences and may wish to influence the choice of allocation and membership principles. This raises questions regarding the factors that influence the choice of such principles in practice. Thus, the core research question of this thesis is:

> *How can the choice of allocation and membership principles in permit trading schemes be explained?*

The analytical framework (chapter 2) for this thesis draws upon the general mechanisms for the choice of allocation principles developed by Elster (1992), using various other literatures to elaborate and contextualize them for the specific case of permit trading schemes and explore the choice of membership principles. The framework identifies different relevant actors, such as political authorities and

prospective scheme members, and elucidates how considerations for equity, efficiency, and self-interest are expected to influence their *preference formation* with respect to the choice of allocation and membership principles in a permit trading scheme.

Equity, efficiency, and self-interest play a central role in the framework due to their importance in both scholarly work and real-world policy discussions around the design of permit trading schemes. Thus, for example, proponents of permit trading schemes see the fact that permit trading schemes steer and constrain the presumed self-interested behavior of scheme members in such a way that a given environmental goal can be achieved more efficiently than through alternative policy instruments as one of their key benefits. This however also implies that self-interest is likely to influence actors' preferences. To the extent that they can successfully bargain in favor of their self-interest, the design of the permit trading scheme may thus deviate from the most efficient choice.

Considerations related to equity—e.g., the presumed impact of certain allocation and membership principles on vulnerable groups, or groups deemed to merit some form of special treatment—also play an important role in preference formation. Different actors may hold different perspectives regarding what sort of special considerations a particular group should receive, if at all.

The analytical framework then examines how different processes of *preference aggregation*—such as coalition building, bargaining and compromise, and accretion—affect the extent to which different actors' preferences are reflected in the final choice of allocation and membership principles.

The methodological chapter (3) clarifies how permit trading schemes are defined in the context of this thesis in order to explain the case selection. This discussion shows that there is quite some disagreement in the literature regarding what, exactly, market-based instruments are, and which sub-group of market-based instruments can be considered permit trading schemes. However, by strictly excluding all those cases that do not fit the definition developed in this chapter, it can be ensured that the remaining cases are comparable with respect to the relevant design characteristics, despite operating in different issue areas and contexts. Chapter 3 moreover provides an overview of how the dataset of permit trading schemes was constructed, including explanations of how relevant cases were identified and how key variables were coded. It also addresses how the case studies were selected and conducted.

Chapter 4 uses insights from the dataset to provide an overview of permit trading schemes in three issue areas: emissions trading schemes, fisheries individual

transferable quota schemes, and water quality trading schemes. It outlines where and when permit trading schemes have been adopted and how they have developed over time. It moreover summarizes expectations in the literature regarding the preferences of different actors in the three issue areas with respect to allocation principles, and their ability to promote these preferences during the processes of preference aggregation. These expectations are then compared and contrasted with data on the actual allocation principles chosen in the three issue areas.

The dataset covers 76 emissions trading schemes, 27 water quality trading schemes, and 130 ITQ schemes—including schemes that are in operation, as well as those that have ended, are planned/under consideration, or never moved to implementation. The first ITQ schemes were implemented in the 1970s,[85] the first pilot water quality trading schemes were in the 1980s, and the first emissions trading schemes (the Regional Clean Air Incentives Market, which regulated NO_x and SO_2 emissions in Los Angeles, and the U.S. SO_2 Acid Rain program) were implemented in the early 1990s.

Currently, permit trading schemes exist mostly in high-income countries. Moreover, there is a regional clustering of such schemes in North America and Oceania. Considering that much of the experimentation on permit trading schemes happened in the United States and other high-income countries, it is not surprising that these were for a long time also the countries where the vast majority of permit trading schemes was implemented. However, as permit trading schemes are increasingly also implemented and considered in other contexts, their appropriateness in these circumstances needs to be explored. For example, small-scale, community-based fisheries are more common in developing countries. The design of ITQ schemes—including the choice of allocation and membership principles—can affect the extent to which such small-scale fishing operations remain viable in the long term. Moreover, the complex institutional arrangements that are necessary for an effective ITQ scheme—such as costly monitoring systems—can also constitute a greater relative burden in less developed countries.

In terms of allocation and membership preferences, across all three issue areas, scholars expect that the need to achieve political support and the risk that incumbent resource users will try to block allocations that are not in their interest will frequently

[85] However, some forms of catch shares are much older. As Costello et al. (2008, p. 1679) point out, "individual fishing rights have been implemented on small spatial scales in traditional cultures for millennia". Moreover, other forms of catch shares that are beyond the scope of this dataset, such as territorial use rights fisheries (TURFs) and individual transferable effort quotas, may have also been implemented earlier already.

result in grandfathering[86] as a chosen allocation principle. The bargaining power of some actors is expected to be quite low, implying that allocation principles preferred by such actors—e.g. smaller fishing operations in the case of ITQ schemes—are rarely reflected in the choice of allocation principles. However, the literature also suggests some differences across issue areas, for example with respect to typical understandings of and trade-offs between equity and efficiency in emissions trading and ITQ schemes. Thus, scholars have documented an increasing trend toward auctioning in emissions trading schemes, based on a growing awareness of the inefficiencies of grandfathering and heightened sensibilities with respect to the inequity of windfall profits for polluters. Conversely, in ITQ schemes auctions are often seen as threatening small fishing operations. Some scholars advocate community-based allocations to protect rural fishing communities and avoid an increasing concentration of quotas in large ports.

Many of these observations and expectations in the scientific literature on permit trading schemes are based on single case studies, or cases within a single issue area. Comparing the literature to the dataset of permit trading schemes presented in this thesis allows these observations and expectations to largely be confirmed. A clear trend across all three issue areas is that the largest incumbent resource users are rewarded (or placated) by grandfathering at least part of the permits, while there is a clear increase in the use of auctioning in emissions trading schemes over time, in contrast to a very limited use of auctions in the case of fisheries. However, in chapter 4 it is also observed that the combinations of allocation principles that are chosen indicate that a mix of preferences related to self-interest, equity, and efficiency are taken into consideration. With such a diversity of preferences to take into account, deciding on a coherent and consistent approach is difficult. Consequently, allocation principles and formulas rarely reflect the ideal-type, unfettered free market expected in theory, nor are they perfectly suited to addressing the typical economic and social concerns associated with the introduction of permit trading schemes.

Such inconsistencies are likely unavoidable. After all, reality is far more complex than theoretical models of permit trading schemes. Policymakers implementing permit trading schemes often pursue multiple goals—not just efficiency—and can rarely avoid taking the preferences of schemes members and other actors into account. A frequent result are therefore policies that don't fully satisfy anyone's expectations but represent a workable compromise.

Chapters 5 and 6 present two case studies on a water quality trading scheme—the Hunter River Salinity Trading Scheme (HRSTS), and an individual transferable

[86] I.e., allocation of permits in proportion to historical use of the resource being allocated.

quota scheme—the British Columbia Integrated Groundfish Individual Transferable Quota Program (BC ITQ). Using in-depth interviews, historical documents (such as consultation minutes), program evaluations and official documents as well as secondary sources such as academic and policy papers, these two case studies map the processes of allocation and membership preference formation and aggregation, and explore the role of self-interest, efficiency, and equity in these processes.

Both case studies provide insights regarding the dynamics of self-interest in bargaining over the choice of allocation and membership principles. In the ITQ case study, there was considerable diversity in the preferences of different members of the commercial fishing sector. Moreover, aboriginal and non-aboriginal coastal communities, crew, processing plant operators, and various other actors all had a stake in terms of the potential impact of alternative allocation and membership principles. While the complex allocation formulae in the fishery give consideration to some of these different interests, ultimately some groups within the fishery nonetheless feel that they have suffered economically. Moreover, it is possible that positions become more entrenched over time, as those disadvantaged by the scheme are more likely to leave the fishery, thus affecting the bargaining power among those remaining in the fishery.

In the water quality trading case study presented in chapter 6, self-interest was also an important motivation for scheme members, who argued in favor of credits that are allocated for free in perpetuity rather than expiring and being auctioned at regular intervals. However, in this case the strong preferences of policymakers in favor of auctions as well as the regulatory context were in opposition to exclusively grandfathered credits. Firstly, existing legislation suggested that permit trading schemes should be open to participation by anyone. Secondly, legislation also indicated that allocating credits for free in perpetuity to the initial scheme members could be seen as an unacceptable restriction on competition, while auctions would provide regular opportunities for new actors to enter the market. Thus, this case illustrates how the relevance of the self-interest of scheme members in the choice of allocation and membership principles can be constrained by powerful contrary preferences.

An issue that repeatedly reappears throughout chapters 4, 5 and 6 is that understandings of equity and efficiency differ—across issue areas, within issue areas and even when discussing a single case. This is particularly surprising with respect to efficiency, as efficiency is often framed as a more objective measure than equity in guiding the design of permit trading schemes (e.g. Daigneault et al., 2017).

For example, in the case of the BC ITQ scheme, efficiency on the one hand means that the scheme should be designed in a way that limits the cost and management burden for the Department of Fisheries and Oceans (DFO). On the other hand, efficiency is also mentioned in the context of DFO's fleet rationalization goals: by reducing the number of vessels catching the same amount of fish, the fishery itself is made more efficient. In comparison, in the case of the HRSTS one understanding of efficiency is that the scheme should be implemented at the lowest overall cost to the community. Moreover, restrictions on competition are seen as inefficient and are precluded by existing legal frameworks. These different interpretations can have quite different implications with respect to allocation and membership, and moreover suggest that efficiency is not an unambiguous goal to pursue.

Finally, chapter 7 synthesizes the key findings of this thesis and embeds them in broader reflections on allocation processes and permit trading schemes. It examines the implications of these findings for discussions on the extent to which scheme members inherently behave egotistically or are incentivized to do so because permit trading schemes operate based on an assumption of self-interested behavior on the part of scheme members and thus seek to steer such self-interest in a particular direction. It also contextualizes and elaborates key findings on the role of efficiency and equity in permit trading schemes. The conclusion also reflects on the value and limitations of the analytical framework developed in this thesis.

Moreover, the concluding chapter emphasizes the role of the design of bargaining and consultation processes as a means of involving diverse stakeholder groups in the choice of allocation and membership principles. Existing power differences between stakeholder groups can affect their ability to participate in such processes, which may then reproduce (or exacerbate) such power differences. Well-designed consultation processes are essential as a means of explicating the preferences of different stakeholders, as they typically have very different understandings of what would, for example, constitute an equitable allocation or an efficient scheme.

Crucially, the two case studies indicate that the initial process of deciding on a particular regulatory instrument—permit trading scheme or other—should be transparent and inclusive. Even if a permit trading scheme turns out to be the most appropriate option for a given context, support for such a scheme will likely be higher if stakeholders had an opportunity to participate in the evaluation of alternative regulatory options and conclude that the choice of a particular regulatory option is impartial. Consequently, even though inclusive consultations covering all aspects of permit trading scheme design—including the initial decision to adopt

such a scheme and the evaluation of alternatives—are costly and time intensive, this is not an issue where policymakers should aim to limit costs.

Moreover, even if consensual decisions on a permit trading scheme, allocation and membership principles have been made, consultation structures such as advisory boards should be maintained. Considering that the initial design of a permit trading scheme is unlikely to remain the same in perpetuity, such advisory boards provide opportunities to consult with relevant stakeholders on future changes.